University of Saskatchewan
Department of Electrical Engineering
EE 212
Mid-term Exam

Instructor: R. Karki **Feb 14, 2003**

Note: All the equations carry equal marks.

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1. Calculate the voltage across the 1Ω resistor in Figure 1.

$6.67\angle 0^\circ$ V

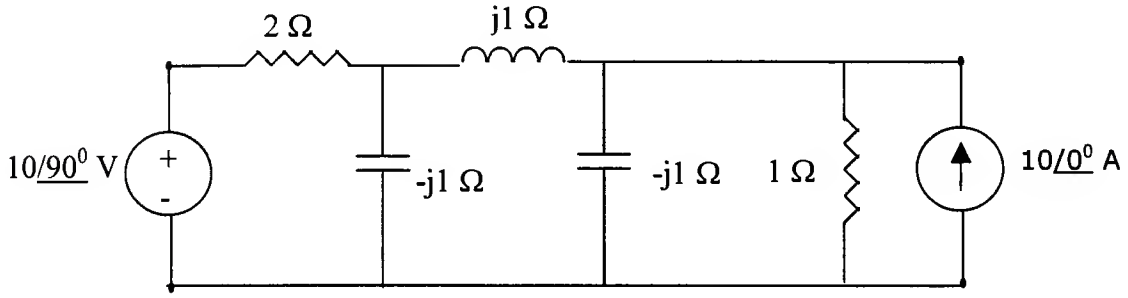

Figure 1

2. Find the instantaneous current through the 10Ω resistor in Figure 2 when the instantaneous current from the current source is 10 Amps?

where:
$i(t) = 10 \text{ Sin } (\omega t + 90^0)$ amps
$v(t) = 90 \text{ Sin } \omega t$
and both the sources are at 60 Hz frequency.

0.5 A

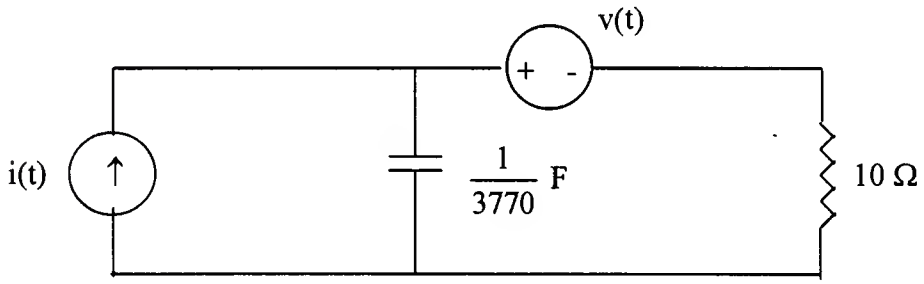

Figure 2

3. A 50 kVA transformer supplies a 20 kW heating load at unity power factor. How much additional inductive load at 0.8 ~~power factor~~ can the transformer carry?

$26.0309 + j19.5232$ VA

4. Find the RMS value of the current through the 10 Ω resistor in Figure 3. The current waveform from the source can be expressed as:

   $i(t) = 10 + 100 \sin \omega t$

   where ω is equal to the resonant angular frequency of the circuit in Figure 3.

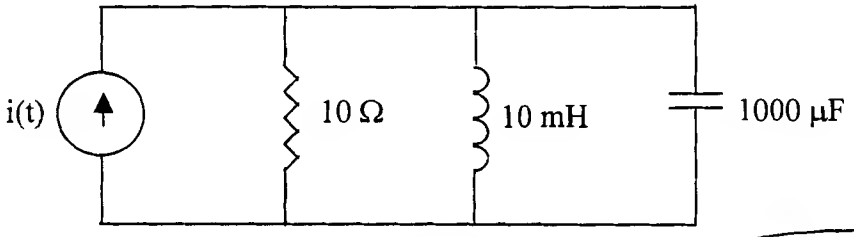

Figure 3

$I_{RMS} = 70.71$ A

The end.